REMARKS/ARGUMENTS

Request for Continued Examination:

The applicant respectfully requests continued examination of the above-indicated application as per 37 CFR 1.114.

Claims 1-2, 5, 7-12, 14, 16, 18, and 20-26 remain in this application. Please reconsider this application for the least the reasons set forth herein.

Response to the claim rejections:

Regarding the present invention, there are some issues that need to be clarified first. Please refer to the specification of the current application, it describes that most OFDM transceivers of the prior art suffer from problems of inter-symbol interference (ISI) and inter-carrier interference (ICI) (*Spec.: Paragraph [0005]*). The claim invention of this application is focusing on solving the imprecision of the boundary detection **induced by ISI** instead of ICI (*Spec.: Paragraphs [0005]-[0009]; 1st and 2nd embodiments as shown in Figs. 1 & 2*). **Therefore, in order to detect and compensate for the ISI caused by the factor of different symbols instead of the factor of different sub-carriers, the ISI detector/detection method of the present invention refers to signals** (such as pilot signals) **of different symbols transmitted via THE SAME sub-carrier** and thereby computes correlations between these signals and accordingly compensates for the ISI effect (*Spec.: 1st and 2nd embodiments as shown in Figs. 1 & 2, Paragraphs [0019]-[0020], [0023] and [0028]-[0029].*)

Besides, it is acknowledged that **one communication channel corresponds to multiple sub-carriers** in an OFDM system (e.g. an IEEE 802.11a communication channel corresponding to 52 sub-carriers), and consequently **a communication**

channel is well distinguished from a sub-carrier in this field.

Based on the above clarification, Applicant respectfully asserts that the amended claims 1 and 14 are patentable over the combination of the cited references, i.e. Awater (US 2005/0152317), Gummadi (US 7,136,436) and Kakura (US 2003/0090994), because it fails to teaches or suggests at least the following claim limitations:

(1) computing a first correlation value according to specific signals of **a current and a previous symbols** and a second correlation value according to specific signals of **the current and a following symbols**, wherein **the specific signals of the previous, current and following symbols are transmitted via the same sub-carrier**; and

(2) **delaying a timing of a detected boundary**, which is used for processing a plurality of different symbols comprising the previous, current and the following symbols, **when the first correlation value is larger than the second correlation value**, and **advancing the timing of the detected boundary when the second correlation value is larger than the first correlation value**.

As for the claim limitation (1), the cited reference, Awater, does not teach this limitation as the Office action of July 2, 2008 recognized (*The Office Action: Page 3*). Applicant would like to supplement some reasons for distinguishing Awater from the claim invention as follows. Please refer to Awater. Awater discloses that a packet

detector detects 802.11a packets, 802.11b packets and interference that is within a monitored frequency range but is not formatted as 802.11a packets or 802.11b packets (*Awater: Abstract*). Fig. 5 of Awater shows an implementation of **802.11b** packet detector 102 (*Awater: Fig.5; Page 4, Paragraph [0037]*), which is irrelevant to the claim invention because 802.11b belongs to a direct-sequence spread-spectrum (DSSS) system distinct from an OFDM system in this field (*Awater: Page 1, Paragraph [0002]*). Fig. 7 of Awater, however, discloses a 802.11a detector 104, which belongs to an OFDM system (*Awater: Page 1, Paragraph [0002]*), for performing 802.11a packet detection. The detector 104 has OFDM correlators 402(0), 402(1) and 402(2) for **receiving N input signals $r_0(k)$, $r_1(k)$, and $r_2(k)$ from N receive antennas respectively** (*Awater: Fig. 7; Page 6, Paragraph [0061]*). The output of each OFDM correlator 402 is then processed to determine two differential correlations by multiplying each OFDM correlator output with a delayed version of itself to form differential detections that are then summed over all OFDM correlators (i.e. **over all antennas**) (*Awater: Fig. 7; Page 6, Paragraph [0062]*). Accordingly, it clearly shows that **Awater aims at performing correlations between the k-th samples of input signals from different antennas** (*Awater: Page 6, Paragraphs [0061]-[0062]*), **but is silent on computing a first and a second correlation values according to specific signals of different symbols which are transmitted via the same sub-carrier**.

Awater, therefore, does NOT teach or suggest how to detect and compensate for inter-symbol interference (ISI) in the way of the present invention. Please note that although Awater states that "…the differential correlations $DC_{b1}(n)$ and $DC_{b2}(n)$ are taken over overlapping parts of **a symbol** (e.g., the 11-th and 12-th sample appear in

both sums). This ensures that there is always one differential correlation with maximum signal power and minimal ISI regardless of data transitions in **802.11b** signals" (*Awater: Page 5, Paragraph [0054]*), this teaching not only **differs from the claimed OFDM system but also contraries to the claim requirement of utilizing different symbols** and thereby **provides an opposite motivation of computing correlation values according to specific signals of the different symbols being transmitted via the same sub-carrier**.

Although another cited reference, Gummadi, describes that "correlating a received signal with previously signals has an additional advantage in that the received signal is being correlated with a reference signal that has transmitted through **the same communication channel** that it is being transmitted through" (*Gummadi: Col. 5, line 58 – Col. 6, line 1*), **this description at most teaches the received signal and the reference signal are transmitted through the same communication channel instead of the same sub-carrier**. Referring to the clarification at the first, a communication channel corresponds to multiple sub-carriers in an OFDM system and thus is well distinguished from a sub-carrier in this field. Even though Gummadi further discloses that "…the present invention…is applicable to both single-carrier and multi-carrier systems" (*Gummadi: Col. 9, lines 63-65*), this single carrier system is intrinsically different from the claimed OFDM system (multi-carrier system) and the multi-carrier system of Gummadi still fails to teach or suggest **generating correlation values according to specific signals of different symbols being transmitted via the same sub-carrier**. In addition, the claim invention further

requires **a current and a previous symbols** for computing the first correlation value and **the current and a following symbols** for computing the second correlation value, in which **the first and second correlation values are compared with each other** **so as to detect and improve the inter-symbol interference by adjusting a timing of a detected boundary**. This claim requirement is nowhere taught or suggested by Awater and Gummadi as well. As a result, Gummadi does not compensate for the deficiencies of Awater.

In fact, Gummadi teaches a method for **detecting the occurrence of a boundary** (*Gummadi: Col. 1, lines 6-11; Col. 2, lines 9-35*), but **does NOT improve the accuracy of the detected boundary**, which is demonstrated by the descriptions of Gummadi in that "…since the present invention has **the same false boundary detection/non-detection probabilities as the standard boundary detection techniques**, use of the present invention does not negatively impact the accuracy performance of the boundary detection" (*Gummadi: Col. 2, lines 36-40*). The present invention, on the contrary, is for detecting inter-symbol interference (ISI) and accordingly **improving a timing of a detected boundary**. As a result, a person of ordinary skill in the art will not be motivated by Awater in view of Gummadi to achieve the claim invention.

For at least the above explanations, Applicant has demonstrated that Awater in view of Gummadi fails to disclose the cliam limitation (1). As for the fore-mentioned claim limitation (2), Awater in view of Gummadi does not teach this limitation as the

Office action of July 2, 2008 recognized (*The Office Action: Pages 3-4*). The Office action, however, indicates that the other cited reference, Kakura, discloses this limitation. After reviewing Kakura carefully, Applicant respectfully asserts that Kakura does not teach or suggest the claim limitation (2) for at least the following reasons.

Regarding Kakura, Kakura states that: "The comparing section 117 inputs the correlation value and outputs a comparison resultant signal **by comparing it with the threshold values Vh and Vl**. The comparing section 117 outputs a + control signal as the comparison resultant signal to elongate the guard interval section length, when the correlation value is smaller than threshold value Vl, and outputs a - control signal as the comparison resultant signal to shorten the guard interval section length when the correlation value is larger than threshold value Vh. No control signal is outputted to hold the guard interval section length when the correlation value is in the range between the threshold value Vh and the threshold value Vl." (*Kakura: Page 10, Paragraph [0127]*). This statement clearly shows that Kakura teaches **comparing a correlation value with threshold values Vh and Vl** to elongate, shorten and hold the guard interval section length when the correlation value is smaller than the Vl, larger than the Vh and in the range between the Vh and the Vl respectively, while the claim limitation (2) requires **delaying a timing of a detected boundary when the first correlation value is larger than the second correlation value due to the timing of the detected boundary being ahead of a timing of an ideal boundary** and **advancing the timing of the detected boundary when the second correlation value**

is larger than the first correlation value due to the timing of the detected boundary lagging behind the timing of the ideal boundary. Accordingly, Kakura at most teaches adjusting a guard interval section length by comparing a correlation value with two threshold values Vh and Vl but does not teach or suggest **delaying and advancing a timing of a detected boundary with respect to the comparison result of comparing a first correlation value with a second correlation value**. Therefore, Kakura does not disclose the claim limitation (2) and fails to compensate for the deficiencies of Awater in view of Gummadi.

To sum up, Awater in view of Gummadi and further in view of Kakura dose not teach or suggest a combination of all of the limitations of the amended claim 1 or 14. Even a person of ordinary skill in the art will not be able to predict the present invention without the **missing parts** of these references, e.g. the fore-mentioned claim limitations (1) and (2). Please also note that there are different solutions to improve ISI effect as exemplified by the AAPA of the current application, and thereby an ordinary skilled person will not be necessarily prompted to achieve the claim invention or be able to foresee the claim invention without the disclosure of this application. As a result, claims 1 and 14 are patentable over the cited references. Since claims 2, 5, 7-12, 16, 18, and 20-26 are dependent upon claims 1 and 14 respectively, if claims 1 and 14 are found to be allowable, so too should the dependent claims.

Conclusion:

Therefore, all pending claims are submitted to be in condition for allowance. The

Examiner is encouraged to telephone the undersigned if there are informalities that can be resolved in a phone conversation, or if the Examiner has any ideas or suggestions for further advancing the prosecution of this case.

Sincerely yours,

Date: 10/27/2008

Winston Hsu, Patent Agent No. 41,526
P.O. BOX 506, Merrifield, VA 22116, U.S.A.
Voice Mail: 302-729-1562
Facsimile: 806-498-6673
e-mail : winstonhsu@naipo.com

Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 12 hours behind the Taiwan time, i.e. 9 AM in D.C. = 9 PM in Taiwan.)